

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problems Mailbox.**



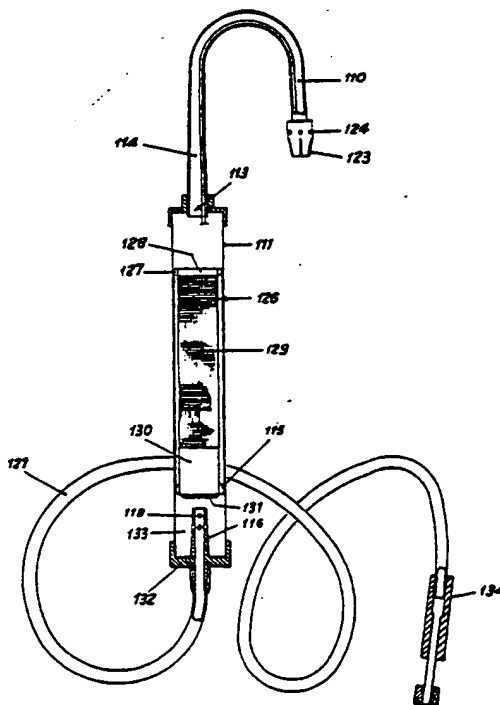
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁴ : A61C 17/04	A1	(11) International Publication Number: WO 88/ 10102 (43) International Publication Date: 29 December 1988 (29.12.88)
---	----	---

(21) International Application Number: PCT/IT88/00047
 (22) International Filing Date: 22 June 1988 (22.06.88)
 (31) Priority Application Number: 48093 A/87
 (32) Priority Date: 22 June 1987 (22.06.87)
 (33) Priority Country: IT
 (71)(72) Applicant and Inventor: IANNUZZI, Silvio [IT/IT];
 Piazza Torquato Tasso, I-80067 Sorrento (IT).
 (74) Agent: MASSARI, Marcello; Via Fontanella Borghese,
 23, I-00186 Rome (IT).
 (81) Designated States: AT (European patent), BE (Euro-
 pean patent), BR, CH (European patent), DE (Euro-
 pean patent), DK, FR (European patent), GB (Euro-
 pean patent), IT (European patent), JP, LU (Euro-
 pean patent), NL (European patent), SE (European
 patent), US.

Published
 With international search report.

(54) Title: SALIVA SUCKING SPOUT FOR DENTIST APPARATUS FREE FROM BACTERIUM AND VIRUS IN-
 FECTION RISK



(57) Abstract

Saliva sucking spout (10) for dentist apparatus free from the bacterium and virus infection risk provided with a rack-
 ing container (11, 113) and a one-way valve (12, 134) which cooperate to prevent every bacterium flora, normally formed
 in the hose connecting the spout to the sucking device from going back up to the sucking sp out put in the patient's mouth.
 Preferably, the spout is of the disposable type.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT Austria	FR France	ML Mali
AU Australia	GA Gabon	MR Mauritania
BB Barbados	GB United Kingdom	MW Malawi
BE Belgium	HU Hungary	NL Netherlands
BG Bulgaria	IT Italy	NO Norway
BJ Benin	JP Japan	RO Romania
BR Brazil	KP Democratic People's Republic of Korea	SD Sudan
CF Central African Republic	KR Republic of Korea	SE Sweden
CG Congo	LI Liechtenstein	SN Senegal
CH Switzerland	LK Sri Lanka	SU Soviet Union
CM Cameroon	LU Luxembourg	TD Chad
DE Germany, Federal Republic of	MC Monaco	TG Togo
DK Denmark	MG Madagascar	US United States of America
FI Finland		

SALIVA SUCKING SPOUT FOR DENTIST APPARATUS FREE
FROM BACTERIUM AND VIRUS INFECTION RISK

The subject matter of the invention is a saliva sucking spout for dentist apparatus free from bacterium and virus infection risk.

How it is known, during the dentist operations, the saliva which collects in the sublingual part of the patient's mouth is sucked by a spout or a cannula shaped like the handle of an umbrella, of the disposable type.

One end of the spout is open and the other one is joined to the hose which connects the same to a filter and an aspirator.

Such an arrangement is unhygienic, since the sucking spout, though of the disposable type, can be contaminated right from the moment of his insertion on the hose, by the bacterium flora, which exists in the bore of the hose connected directly to the spout.

When the spout is put into the patient's mouth, and the sucking action has not yet started or has been interrupted, this arrangement allows air, liquids or other substances to pass in the opposite direction from the hose to the spout.

- 2 -

The object of the invention is to eliminate this inconvenience providing a spout of new conception, which is connected to a small racking container. A one-way valve is located at the inlet of the container, which valve is normally closed and opens under the sucking action of the sucking device. This valve closes again at the interruption or decrease of the sucking action.

The valve is preferably of the membrane type, as it is formed by a plate disc of a suitable material, which bends under the sucking action.

The intrinsic resilience of the valve, which can be controlled by a return spring, allows the opening and closing action to take place.

Moreover, the cavity of the spout or cannula can be conically shaped in order to eliminate any possible occlusions.

Finally the spout unit is of the disposable or single-use type.

The invention will be disclosed in further details, referring to the annexed drawing, wherein:

Figure 1 shows the bent spout which is connected to the sucking hose;

Figure 2 is an axial section of the spout unit

- 3 -

and

Figure 3 is a similar section showing an at present preferred embodiment of the invention.

As shown, the invention consists of a spout
5 10 made of a flexible material which maintains the given shape; a container 11 connected to the end of spout 10 and a valve 12 put in container 11 in order to control the inlet 13 which connects bore 14 of spout 10 to bore 15 of container 11.

10 A side tube 16 provided with perforation 18 passes through lower panel 20 and protrudes inside container 11. On the end of tube 16, outside container 11 a sucking hose 21 is inserted which normally contains a filter.

As clearly shown, valve 12 that controls in-
15 let 13 is of the membrane type and comprises a plate disc of a flexible material located against the top wall of container 11, wherein inlet 13 is formed. Valve 12 is normally in the closed position shown by full line in figure 2.

20 When the sucking action starts, a depression is created in container 11 that causes valve 12 to open.

The spout of the invention offers the further

- 4 -

advantage of keeping any particle content, blood or the like sucked from the patient's mouth, owing to the especially designed spout construction according to which the container outlet consists of
5 small perforations 18 at the top of tube 16, on the lower end of which sucking hose 21 is fitted.

A further important feature of the invention is the conical shape of inner bore 14 of spout 10 that prevents any residue from obstructing the same.
10 me.

Figure 3, shows a preferred embodiment of the invention, the parts of which identical or similar to those illustrated in figures 1 and 2 are indicated by the same reference numbers added by 100.

15 In this embodiment container spout 10, container 113 and hose 121 are substantially identical with the corresponding parts of figures 1 and 2.

Spout sucking end 123 is provided with small perforation 124 circumferentially arranged thereon
20 and leads to container 111 through opening 113 which is devoid of the one-way valve.

Inside container 111 a cylindrical filter 126 is contained having the rim 127 its upper circular opening 128 sealed against the inner surface of the

- 5 -

container wall.

The cylindrical wall of filter 126 is provided with perforations 129 except that in portion 130 adjacent to bottom 131 thereof that is closed and spaced from the inner surface of the container wall.

Tube 116, passing through sase 132 of container 111 and protruding there from both inside and outside container III puts in communication, through holes 118, space 133 existing between bottom 131 of filter 126 and base 132 of container III with base 121.

The upper end of which is fitted on outer end of tube 116.

Finally the remote end of hose 121 is provided with a spring biased one-way valve 134 that prevents any passage of material or saliva residue towards hose 121 from the sucking device (not shown).

This construction is very safe since it prevents any material from passing through the sucking beak from the patients month to the sucking device.

As a matter of fact in this construction many "traps" are made up to avoid any passage of material from the patient's month to the sucking device, as, for instance filter 126 lower part 130 thereof and spa-

- 6 -

ce 133.

Furthermore one-way valve 134 is a barrier in the opposite direction as it prevents any passage from the sucking device, wherein the outer part of valve 134 is inserted, toward hose 121 and sucking spout 110.

As it will be apparent to the persons skilled in the art the invention overcomes the inconveniences of the prior art spouts.

It will be also apparent that modifications and changes can be made in the construction as disclosed and illustrated without departing from the scope thereof.

For instance one-way valve is shown in Figures 1 and 2 can be of different construction and/or nature.

Essentially the main features of the invention, providing a disposable or single-use sucking spout, are:

- 1) To prevent any passage of particle material from the patient's mouth or incision to the sucking device.
- 2) To prevent any passage, in the opposite direction, of saliva or saliva residue accumulated in the

- 7 -

sucking device from the latter to the patient's
mouth.

- 8 -

CLAIMS

1. A saliva sucking spout (10,110) to be connected through a hose (21, 121) to a sucking device for dentist apparatus or drainage in surgical operations, free from the bacterium and virus infection risk, characterised in that the spout is provided with a racking container (11, 111) and a one-way valve (12,134) which cooperate to prevent every bacterium flora, normally formed in the hose (21, 121) connecting said spout (10,110) to the sucking device from going back up to the sucking spout (10, 110) put in the patient's mouth or incision.

2. The saliva sucking spout of claim 1, wherein the whole unit is of the disposable type and is made of a suitable plastic material.

3. The saliva sucking spout of claim 1 wherein a filter (126) is located in said container (111) between the inlet (113) connected to said spout (110) and the outlet (116,118) thereof connected to said hose (110).

4. The saliva sucking spout of claim 1, wherein said a racking container (11) is fixed at the bottom of said cannula (10) and said one-way valve (12) is located inside said container (11), at said inlet

- 9 -

(13) in order to control said inlet (13) which connects bore (14) of said spout (10) to the cavity (15) of said racking container (11).

5. The saliva sucking spout of claim 1 wherein said one-way valve (134) is located at the free end of said hose (121) and is inserted in said sucking device.

1/2

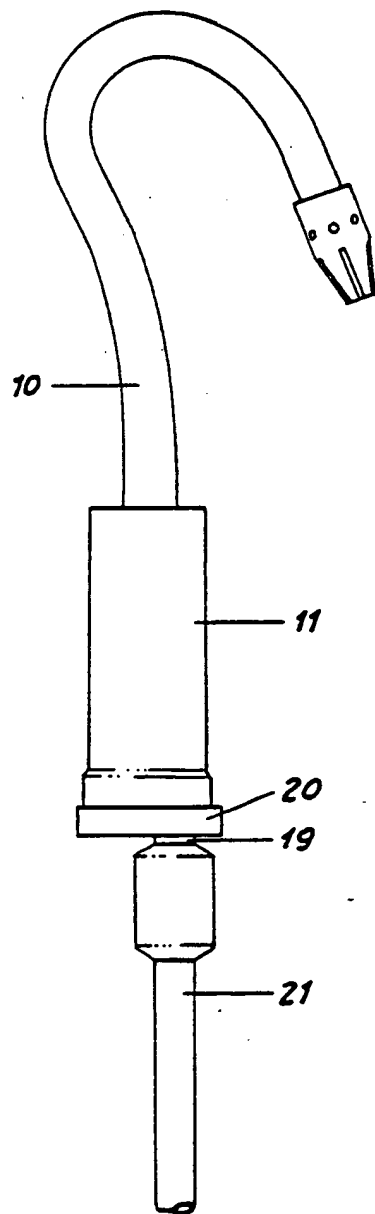


FIG. 1

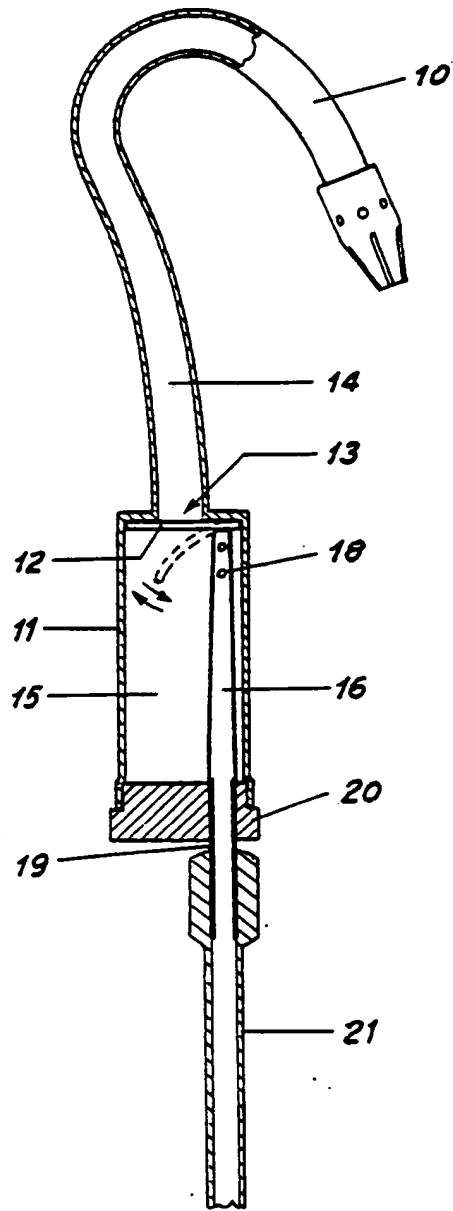


FIG. 2

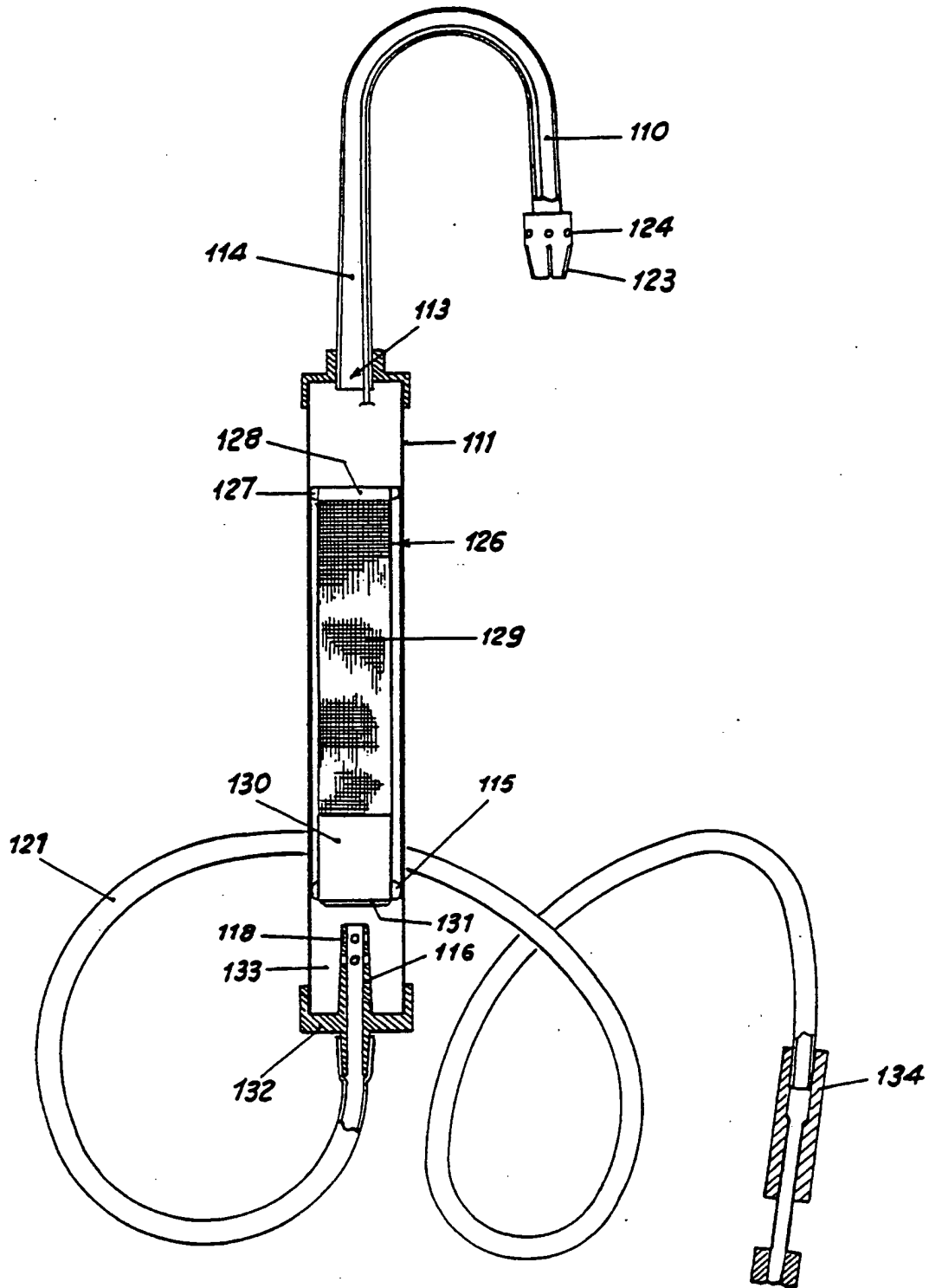


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No PCT/IT 88/00047

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : A 61 C 17/04																				
II. FIELDS SEARCHED <div style="text-align: center; margin-top: 5px;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border-bottom: 1px solid black; padding: 2px 5px;">Classification System</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">Classification Symbols</td> </tr> <tr> <td style="padding: 5px;">IPC⁴</td> <td style="padding: 5px;">A 61 C; A 61 M</td> </tr> </table> <div style="text-align: center; margin-top: 5px; font-size: small;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸</div>			Classification System	Classification Symbols	IPC ⁴	A 61 C; A 61 M														
Classification System	Classification Symbols																			
IPC ⁴	A 61 C; A 61 M																			
III. DOCUMENTS CONSIDERED TO BE RELEVANT¹ <table style="width: 100%; border: none;"> <tr> <th style="width: 10%; border-bottom: 1px solid black; padding: 2px 5px;">Category ⁹</th> <th style="width: 70%; border-bottom: 1px solid black; padding: 2px 5px;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%; border-bottom: 1px solid black; padding: 2px 5px;">Relevant to Claim No. ¹³</th> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">DE, A, 3316397 (B. WASSERFILTER) 31 January 1985, see claim 1; figures --</td> <td style="vertical-align: top; padding: 5px;">1, 3</td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">DE, A, 1947123 (FERROSAN) 26 March 1970, see page 6, line 14 - page 7, line 18; figure 1 --</td> <td style="vertical-align: top; padding: 5px;">1, 2, 3, 4</td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 4013076 (PUDEBAUGH) 22 May 1977, see column 4, lines 8-16; figure 3 --</td> <td style="vertical-align: top; padding: 5px;">1, 4</td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 4522592 (JOHNSON) 11 June 1985, see claim 1; figures --</td> <td style="vertical-align: top; padding: 5px;">1, 4</td> </tr> <tr> <td style="vertical-align: top; padding: 5px;">A</td> <td style="padding: 5px;">US, A, 3889657 (BAUMGARTEN) 17 June 1975, see description; figures -----</td> <td style="vertical-align: top; padding: 5px;">1, 3</td> </tr> </table>			Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	A	DE, A, 3316397 (B. WASSERFILTER) 31 January 1985, see claim 1; figures --	1, 3	A	DE, A, 1947123 (FERROSAN) 26 March 1970, see page 6, line 14 - page 7, line 18; figure 1 --	1, 2, 3, 4	A	US, A, 4013076 (PUDEBAUGH) 22 May 1977, see column 4, lines 8-16; figure 3 --	1, 4	A	US, A, 4522592 (JOHNSON) 11 June 1985, see claim 1; figures --	1, 4	A	US, A, 3889657 (BAUMGARTEN) 17 June 1975, see description; figures -----	1, 3
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³																		
A	DE, A, 3316397 (B. WASSERFILTER) 31 January 1985, see claim 1; figures --	1, 3																		
A	DE, A, 1947123 (FERROSAN) 26 March 1970, see page 6, line 14 - page 7, line 18; figure 1 --	1, 2, 3, 4																		
A	US, A, 4013076 (PUDEBAUGH) 22 May 1977, see column 4, lines 8-16; figure 3 --	1, 4																		
A	US, A, 4522592 (JOHNSON) 11 June 1985, see claim 1; figures --	1, 4																		
A	US, A, 3889657 (BAUMGARTEN) 17 June 1975, see description; figures -----	1, 3																		
<div style="display: flex; justify-content: space-between; font-size: x-small;"> <div style="width: 45%;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"A" document member of the same patent family</p> </div> </div>																				
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 2px 5px;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border-bottom: 1px solid black; padding: 2px 5px;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="padding: 5px; text-align: center;">15th September 1988</td> <td style="padding: 5px; text-align: center;">- 7. 10. 88</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 2px 5px;">International Searching Authority</td> <td style="border-bottom: 1px solid black; padding: 2px 5px;">Signature of Authorized Officer</td> </tr> <tr> <td style="padding: 5px; text-align: center;">EUROPEAN PATENT OFFICE</td> <td style="padding: 5px; text-align: center;"> P.C.G. VAN DER PUTTEN </td> </tr> </table>			Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	15th September 1988	- 7. 10. 88	International Searching Authority	Signature of Authorized Officer	EUROPEAN PATENT OFFICE	P.C.G. VAN DER PUTTEN										
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report																			
15th September 1988	- 7. 10. 88																			
International Searching Authority	Signature of Authorized Officer																			
EUROPEAN PATENT OFFICE	P.C.G. VAN DER PUTTEN																			

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

IT 8800047
SA 22957

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 29/09/88
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A- 3316397	31-01-85	None	
DE-A- 1947123	26-03-70	FR-A- 2018258	29-05-70
		GB-A- 1273387	10-05-72
		US-A- 3661144	09-05-72
US-A- 4013076	22-03-77	None	
US-A- 4522592	11-06-85	None	
US-A- 3889657	17-06-75	None	